

**Notice of Allowability**

Application No.

09/628,477

Examiner

Anh Ly

Applicant(s)

DUSSUD, PATRICK H.

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 08/10/2004.
2. ☒ The allowed claim(s) is/are 5-9, 10, & 15-19 (renumbered as 1-11).
3. ☒ The drawings filed on 31 July 2000 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
JEAN M. CORRIELLUS  
PRIMARY EXAMINER

### **DETAILED ACTION**

1. This Office Action is response Applicant's Amendments filed on 08/10/2004.
2. Claims 1-4, 11-14 and 20 are cancelled.
3. Claims 5-9, 10 and 15-19 are allowed.

### **EXAMINER'S AMENDMENT**

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Timothy B. Scull (Reg. No. 42,137) at 303-357-1670 on TUE. 11/16/2004.

The application has been amended as follows:

The status identifiers of claims 5-9, 10 and 15-19 should be replaced with (Original) instead.

***Allowable Subject Matter***

5. The present application has been thoroughly reviewed. Upon searching a variety of databases, the examiner respectfully submits that claims 5-9, 10 and 15-19 are allowed in light of the applicant's argument and in light of the prior of made record.

**Reason For Allowance**

6. The following is an examiner's Statement of Reasons for Allowance:

The present invention is directed to a method , a system and a computer program product for performing garbage collection in a multiprocessor environment having a shared memory wherein two or more processing units participate in the reclamation of garbage memory objects. The processing units wherein the memory is divided into heaps, perform garbage collection operations with threads on the heap or heaps that are dedicated to that processing units.

The distinct features of the independent claims are that, "upon completion of all marking threads, initiating parallel planning threads in each processing unit associated with a heap, wherein one thread executes within each processing unit and wherein each

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planning thread plans the new locations for objects within the associated heap; upon completion of all the planning threads, initiating parallel relocating threads in each processing unit associated with a heap, wherein one thread executes within each processing unit and wherein each relocating thread updates internal object references based on the new locations determined by the planning threads, the relocation threads updating information for objects within the associated heap; upon completion of all the relocating threads, initiating parallel compacting threads in each processing unit associated with a heap, wherein one thread executes within each processing unit and wherein each compacting thread moves objects within the associated heap to the new locations determined by the planning threads; for each processing unit associated with a heap: a marking module executing a marking phase that marks reachable objects within the shared memory; a planning module for executing a planning phase that plans the relocation the memory objects within the associated heap following the marking of all reachable objects; a relocating module for executing a relocating phase that updates the object references within objects of the associated heap following the planning of the relocation; a compacting module for executing a compacting phase that moves the memory objects of the associated heap following the updating of the object references; and a rendezvous module for determining whether all processing units in the system have completed each preceding phase before starting the next phase."

These distinct features in conjunction with all other limitations of the dependent and independent claims 5-10 and 15-19 render them allowable.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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**Contact Information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh Ly whose telephone number is (571) 272-4039 or via E-Mail: ANH.LY@USPTO.GOV. The examiner can normally be reached on TUESDAY – THURSDAY from 8:30 AM – 3:30 PM.

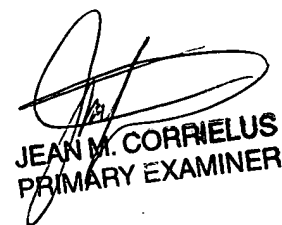
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene, can be reached on (571) 272-4107 or Primary Examiner Jean Corrielus (571) 272-4032.


Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: Central Fax Center (703) 872-9306

  
JEAN M. CORRIELUS  
PRIMARY EXAMINER

ANH LY   
NOV. 16<sup>th</sup>, 2004